

WHAT IS CLAIMED IS:

Sub A-1  
1. A radio receiver comprising a receiving system capable of receiving radio signal according to plural types of radio communication systems, said receiving system comprising plural types of amplifiers each for amplifying a received signal according to said plural types of radio communication systems.

2. The radio receiver as set forth in Claim 1, wherein a selection control portion is provided to select an amplifier to be used according to said radio communication <sup>made</sup> system of the received signal.

Sub A-2  
3. The radio receiver as set forth in Claim 2, wherein said receiving system comprises an output selection portion for outputting said received signal to one of said amplifiers according to said radio communication system; and

said selection control portion is constructed so as to control the selecting process of said output selection portion and to make one of said amplifiers operate according to the radio communication system of said received signal.

4. The radio receiver as set forth in Claim 3, wherein said output selection portion is provided

3 at an intermediate frequency stage where a radio signal  
4 of intermediate frequency band after a radio signal  
5 of radio frequency band is down-converted is entered  
6 as said received signal; and

7 said amplifiers are each constructed as one  
8 adapted for intermediate frequency band which  
9 amplifies said radio signal of intermediate frequency  
10 band.

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1 5. The radio receiver as set forth in Claim  
2 4, wherein said plural types of radio communication  
3 systems comprise a first communication system and a  
4 second communication system whose permissible noise  
5 signal levels differ from each other, said noise signal  
6 being caused to the received signal of itself due to  
7 that of the other radio communication system which  
8 differs from the former;

9 said plural types of amplifiers each comprises  
10 a first amplifier adapted for said first communication  
11 system and a second amplifier adapted for said second  
12 communication system, said first and second amplifiers  
13 being each set with a different bias current amount  
14 so as to each achieve an operating condition meeting  
15 said permissible noise signal level;

16 said output selection portion being  
17 constructed as a distributing switch for distributing  
18 said received signal to one of said first and second

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19 amplifiers; and

20 said selection control portion being  
21 constructed as a switching control portion for  
22 switching the output of said distributing switch to  
23 one of said first and second amplifiers according to  
24 the radio communication system of said received signal  
25 and actuating corresponding one of said first and  
26 second amplifiers.

1 6. The radio receiver as set forth in Claim  
2 5, wherein said switching control portion comprises:

3 a communication system detecting portion for  
4 detecting which one of said first and second  
5 communication systems the radio communication system  
6 of said received signal is, wherein if said first  
7 communication system is detected at said communication  
8 system detecting portion, the output of said  
9 distributing switch is switched to said first  
10 amplifier side and said first amplifier is actuated  
11 while, if said second communication system is detected  
12 at said communication system detecting portion, the  
13 output of said distributing switch is switched to said  
14 second amplifier side and said second amplifier is  
15 actuated.

1 7. The radio receiver as set forth in Claim  
2 6, wherein said second communication system is an

3 analog radio communication system utilizing a desired  
4 modulating system and said first communication system  
5 is a digital radio communication system utilizing a  
6 spread spectrum system whose permissible noise signal  
7 level is lower than that of said analog radio  
8 communication system.

1 8. The radio receiver as set forth in Claim  
2 7, wherein the bias current amount of said first  
3 amplifier is set greater than that of said second  
4 amplifier.

1 Sub  
A4 9. The radio receiver as set forth in Claim  
2 5, wherein said second communication system is an  
3 analog radio communication system utilizing a desired  
4 modulating system and said first communication system  
5 is a digital radio communication system utilizing a  
6 spread spectrum system whose permissible noise signal  
7 level is lower than that of said analog radio  
8 communication system.

1 10. The radio receiver as set forth in Claim  
2 9, wherein the bias current amount of said first  
3 amplifier is set greater than that of said second  
4 amplifier.

1 Sub  
A5 11. The radio receiver as set forth in Claim

2 3, wherein said plural types of radio communication  
3 systems comprise a first communication system and a  
4 second communication system whose permissible noise  
5 signal levels differ from each other, said noise signal  
6 being caused to the received signal of itself due to  
7 that of the other radio communication system which  
8 differs from the former;

9 said plural types of amplifiers each comprises  
10 a first amplifier adapted for said first communication  
11 system and a second amplifier adapted for said second  
12 communication system, said first and second amplifiers  
13 being each set with a different bias current amount  
14 so as to each achieve an operating condition meeting  
15 said permissible noise signal level;

16 said output selection portion being  
17 constructed as a distributing switch for distributing  
18 said received signal to one of said first and second  
19 amplifiers; and

20 said selection control portion being  
21 constructed as a switching control portion for  
22 switching the output of said distributing switch to  
23 one of said first and second amplifiers according to  
24 the radio communication system of said received signal  
25 and actuating corresponding one of said first and  
26 second amplifiers.

1 ✓12. The radio receiver as set forth in Claim

11, wherein said switching control portion comprises:

a communication system detecting portion for detecting which one of said first and second communication systems the radio communication system of said received signal is, wherein if said first communication system is detected at said communication system detecting portion, the output of said distributing switch is switched to said first amplifier side and said first amplifier is actuated while, if said second communication system is detected at said communication system detecting portion, the output of said distributing switch is switched to said second amplifier side and said second amplifier is actuated.

13. The radio receiver as set forth in Claim 12, wherein said second communication system is an analog radio communication system utilizing a desired modulating system and said first communication system is a digital radio communication system utilizing a spread spectrum system whose permissible noise signal level is lower than that of said analog radio communication system.

14. The radio receiver as set forth in Claim 13, wherein the bias current amount of said first amplifier is set greater than that of said second

4 amplifier.

1 *Sub A6* 15. The radio receiver as set forth in Claim  
2 11, wherein said second communication system is an  
3 analog radio communication system utilizing a desired  
4 modulating system and said first communication system  
5 is a digital radio communication system utilizing a  
6 spread spectrum system whose permissible noise signal  
7 level is lower than that of said analog radio  
8 communication system.

1 16. The radio receiver as set forth in Claim  
2 15, wherein the bias current amount of said first  
3 amplifier is set greater than that of said second  
4 amplifier.

1 *Sub A7* 17. A radio receiver comprising:  
2 a reception system capable of receiving a  
3 radio signal according to plural types of radio  
4 communication systems, in which an amplifier shared  
5 in common between said radio communication systems is  
6 provided for amplifying the received signal; and  
7 a control portion for changing an operating  
8 condition of said amplifier into that corresponding  
9 to said radio communication system of the received  
10 signal.

1 18. The radio receiver as set forth in Claim  
2 17, wherein said control portion is constructed as a  
3 bias change control portion for changing the bias  
4 current amount of said amplifier according to said  
5 radio communication <sup>mode</sup> ~~system~~ of the received signal to  
6 change said operating condition.

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1 19. The radio receiver as set forth in Claim  
2 18, wherein said plural types of radio communication  
3 systems comprise a first communication system and a  
4 second communication system whose permissible noise  
5 signal level differ from each other, said noise signal  
6 being caused to the received signal of itself due to  
7 that of the other radio communication system which  
8 differs from the former radio communication system;  
9 and

10 said bias change control portion is  
11 constructed to change the bias current amount of said  
12 amplifier between a first current amount adapted for  
13 the first communication system and a second current  
14 amount adapted for the second communication system so  
15 that an operating condition of the amplifier may  
16 satisfy the permissible noise signal level.

1 20. The radio receiver as set forth in Claim  
2 19, wherein said bias change control portion is  
3 provided with a communication system detecting portion



4 for detecting which one of said first and second  
5 communication systems the radio communication system  
6 of said received signal is, wherein if said  
7 communication system detecting portion detects said  
8 first communication system, then it changes the bias  
9 current amount of said amplifier to said first current  
10 amount while, if it detects said second communication  
11 system, then it changes the bias current amount of said  
12 second current amount.

1 21. The radio receiver as set forth in Claim  
2 20, wherein said amplifier is constructed as an  
3 amplifier adapted for intermediate frequency band  
4 which amplifies the radio signal of intermediate  
5 frequency band after the radio signal of radio  
6 frequency band has been down-converted as said  
7 received signal.

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1 22. The radio receiver as set forth in Claim  
2 21, wherein said second communication system is an  
3 analog radio communication system utilizing a desired  
4 modulating system and said first communication system  
5 is a digital radio communication system utilizing a  
6 spread spectrum system whose permissible noise signal  
7 level is lower than that of said analog radio  
8 communication system.

1           23. The radio receiver as set forth in Claim  
2       22, wherein said first current amount is greater than  
3       said second current amount.

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1           24. The radio receiver as set forth in Claim  
2       20, wherein said second communication system is an  
3       analog radio communication system utilizing a desired  
4       modulating system and said first communication system  
5       is a digital radio communication system utilizing a  
6       spread spectrum system whose permissible noise signal  
7       level is lower than that of said analog radio  
8       communication system.

1           25. The radio receiver as set forth in Claim  
2       24, wherein said first current amount is greater than  
3       said second current amount.

1           ✓ 26. The radio receiver as set forth in Claim  
2       19, wherein said amplifier is constructed as an  
3       amplifier adapted for intermediate frequency band  
4       which amplifies the radio signal of intermediate  
5       frequency band after the radio signal of radio  
6       frequency band has been down-converted as said  
7       received signal.

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1           27. The radio receiver as set forth in Claim  
2       26, wherein said second communication system is an

3 analog radio communication system utilizing a desired  
4 modulating system and said first communication system  
5 is a digital radio communication system utilizing a  
6 spread spectrum system whose permissible noise signal  
7 level is lower than that of said analog radio  
8 communication system.

1 28. The radio receiver as set forth in Claim  
2 27, wherein said first current amount is greater than  
3 said second current amount.

1 *Sub A12* 29. The radio receiver as set forth in Claim  
2 19, wherein said second communication system is an  
3 analog radio communication system utilizing a desired  
4 modulating system and said first communication system  
5 is a digital radio communication system utilizing a  
6 spread spectrum system whose permissible noise signal  
7 level is lower than that of said analog radio  
8 communication system.

1 30. The radio receiver as set forth in Claim  
2 29, wherein said first current amount is greater than  
3 said second current amount.

1 31. The radio receiver as set forth in Claim  
2 18, wherein said amplifier is constructed as an  
3 amplifier adapted for intermediate frequency band

4 which amplifies the radio signal of intermediate  
5 frequency band after the radio signal of radio  
6 frequency band has been down-converted as said  
7 received signal.

1 *Sub A13* 32. The radio receiver as set forth in Claim  
2 31, wherein said second communication system is an  
3 analog radio communication system utilizing a desired  
4 modulating system and said first communication system  
5 is a digital radio communication system utilizing a  
6 spread spectrum system whose permissible noise signal  
7 level is lower than that of said analog radio  
8 communication system.

1 33. The radio receiver as set forth in Claim  
2 32, wherein said first current amount is greater than  
3 said second current amount.

1 *Sub A14* 34. A signal amplifying method in a radio  
2 receiver capable of receiving a radio signal according  
3 to plural types of radio communication systems,  
4 comprising steps of:

5 selecting one of plural types of amplifiers  
6 according to the radio communication system of a  
7 received signal; and

8 amplifying the received signal using the  
9 selected amplifier.

1           35. A signal amplifying method in a radio  
2 receiver capable of receiving a radio signal according  
3 to plural types of radio communication systems,  
4 comprising steps of:

5           changing an operating condition of an  
6 amplifier for amplifying a received signal into that  
7 according to the radio communication system of the  
8 received signal; and

9           with said operating condition changed,  
10 amplifying said received signal.